Re-analysis/sensitivity analysis with different treatment on disease progression between TMZ with RT and RT only arm

Under the original base case analysis it was assumed that on disease progression (i.e. tumour recurrence) patients who had received TMZ as first-line treatment, and those who had not, would have equal chances of having active treatment with chemotherapy, and also that all having active treatment would receive PCV. This, it is agreed, does not reflect that:

1. patients who have received chemotherapy as first-line treatment would be less likely to receive chemotherapy on tumour recurrence, and;
2. patients who have received TMZ as first-line chemotherapy would also be less likely to receive TMZ as treatment on tumour recurrence, and

We have conducted a sensitivity analysis to assess the impact of this choice, as follows:

Original base case analysis

After placebo as 1st line treatment

Get chemotherapy	70%	PCV: 100% TMZ: 0%
Palliative care only	30%	

After TMZ as 1st line treatment

Get chemotherapy	70%	PCV: 100% TMZ: 0%
Palliative care only	30%	

Revised analysis with different treatment on disease progression between intervention and control groups (source: Stupp et al. 2005)

After placebo as 1st line treatment

Get chemotherapy	72%	PCV: 40% TMZ: 60%
Palliative care only	28%	

After TMZ as 1st line treatment

Get chemotherapy	58%	PCV: 75% TMZ: 25%
Palliative care only	42%	

The main model parameters that affect this revised analysis are:

	Parameter in PenTAG model	**Value**
	Weekly cost of PCV	£68.30
	Weekly cost of adjuvant TMZ	£311.40
	Weekly cost of 'active treatment' for recurrent tumour (excl. chemo costs + re-operation costs)	£390 (wk 1) £170 (wks 2+)
	Weekly cost of palliative treatment for recurrent tumour (no chemo costs)	£228 (wk 1) £156 (wks 2+)
	Mean no. weeks in disease progression (TMZ + RT arm)	29.93 weeks
	Mean no. weeks in disease progression (RT only arm)	35.14 weeks

Using the different proportions having active (chemotherapy) vs. palliative management during progression, and – of those having active management – the different proportions having TMZ vs. PCV, (i.e. using the Stupp et al 2005 data) produces the following incremental cost-effectiveness results:

Results with different treatment on progression between TMZ-plus-RT and RT only

	Costs (£)	QALYs	Incremental costs (£)	Incremental QALYs	ICER (£ per QALY)
RT only	20,055,237	794			
TMZ + RT	26,439,084	981	6,383,847	187	34,158
TMZ = temozolomide; RT = Radiotherapy; QALY = Quality-Adjusted Life-Year; ICER = Incremental cost-effectiveness ratio					

For comparison, baseline results as originally reported:

Original baseline results (Table 52)

	Costs (£)	QALYs	Incremental costs (£)	Incremental QALYs	ICER (£ per QALY)
RT only	17,086,676	794			
TMZ + RT	25,642,277	981	8,555,601	187	45,778
TMZ = temozolomide; RT = Radiotherapy; QALY = Quality-Adjusted Life-Year; ICER = Incremental cost-effectiveness ratio					

It should be noted that while, in principle, one would expect choice of first-line treatment to have an impact on choice of (second-line) treatment on tumour recurrence, there are no good data on this relationship. Whether the level of use salvage chemotherapy at tumour recurrence (72%) and the level of use of TMZ (60% of this 72%) at tumour recurrence that was reported in the Stupp et al trial reflects current treatment patterns in the NHS has to be considered.